## **CUMULATIVE INDEX 2000**

## Volume 27

March NUTRITION AND METABOLISM OF THE MICROPREMIE.

pages 1-254

Iune OUTCOME OF THE VERY LOW-BIRTH WEIGHT INFANT,

pages 255-505

September NEONATAL HEMATOLOGY, pages 507–760 December CONGENITAL ANOMALIES, pages 761-1046

Note: Page numbers of issue titles and article titles are in boldface type.

Abdominal wall anomalies, 917-919.

947-978 alpha-fetoprotein levels in, 948 Beckwith-Wiedemann syndrome, 965 bladder exstrophy, 925-926, 952, 962-963 body stalk anomaly, 949, 952-954 cloacal exstrophy, 925-926, 952, 960-962 embryology of, 947-948, 950-951 gastroschisis, 918-919, 954-958 genetic testing in, 949 omphalocele, 917-918, 952, 963-965 in cloacal exstrophy, 952, 961-962 in trisomies, 764 pentalogy of Cantrell, 952, 958-960 ultrasonography of, 948-949

umbilical cord, 965-972 Abdominoschisis, 918-919, 954-958

Abruption, placental, as cerebral palsy antecedent, 290

Acardia (twin reversed arterial perfusion syndrome), 1038-1042

Achondrogenesis, 988-990 Achondroplasia, heterozygous, 983-984 homozygous, 987

Acidosis, metabolic, as cerebral palsy antecedent, 294

Adolescents, as very low-birth weight infant survivors, early pain experience and, 371-372 growth of, 421-428

height, 425-428 weight, 422-425, 427-428 quality of life perceptions of, 407-416

respiratory health of, 428-431

Age, maternal, in outcome of very low-birth weight infants, 443-444, 446, 449-450

multiple gestation rate in, 347-350 versus energy expenditure, 185-186

Agranulocytosis, infantile genetic, bone marrow failure in, 553

Akinesia deformation sequence, 998 Alloimmunization, hydrops fetalis in, 1016-1017, 1023

Alpha-fetoprotein, abdominal wall defects and, 948

Alport's syndrome, thrombocytopenia in,

Amegakaryocytic thrombocytopenia, 662 bone marrow failure in, 547, 553

Amino acids, parenteral, 198-207 administration strategies for, 206-207 drug effects on, 206 early introduction of, 200-201 energy intake and, 202-205 for protein accretion, 45 illness effects on, 205

quality of, 199-200 quantity of, 198-199 stress and, 205-206 toxicity of, 200, 202

Amnioreduction, in twin-twin transfusion syndrome, 1024

Amniotic fluid, analysis of, in preterm birth prediction, 272-273 fetal renal function and, 922-923 granulocyte colony-stimulating factor in,

561-562

Amniotic fluid (Continued)

infection of, as cerebral palsy antecedent, 289–290

hydrops fetalis in, 1014–1016, 1022– 1023

septostomy for, in twin-twin transfusion syndrome, 1024, 1036–1037

serial reduction of, in twin-twin transfusion, 1036

Anabolism, eosinophilia in, 617

Analgesia, for very low-birth weight infants, 374

Anemia, aplastic, congenital syndromes with, 548–552

Diamond-Blackfan, bone marrow failure in, 547, 552–553

erythrocyte transfusions in, 734–735 erythropoietin in, 741–743

Fanconi's, bone marrow failure in, 546, 548–550

thrombocytopenia in, 662

hemolytic, in Rh mismatch, erythropoietin in, 690

immune globulin in, 737–739 hydrops fetalis in, 1016–1017, 1023

iron-deficiency, in micropremies, 119–121 physiologic, erythropoietin replacement in, 683–687

physiology of, 682-683

Anencephaly, 792

Anesthesia, for very low-birth weight infants, 364–365, 374

Aneuploidy, echogenic bowel in, 774–775,

Aneurysm, of umbilical cord, 969 Angiogenesis, erythropoietin in, 530–531

Angiography, in thrombosis, 628 Antibiotics, eosinophilia due to, 617–618

in neutropenia, 585–586 in preterm labor prevention, 276

Antioxidants, bilirubin as, 174–175 in lipid emulsions, 84 vitamin C as, 96–97

Antithrombin deficiency, thrombosis in, 627, 629-631

Anus, disorders of, 912

Aorta, coarctation of, 845-847

thermocoagulation of, in twin reversed arterial perfusion syndrome, 1042 thrombosis in, 627

ventral aspect of, erythropoiesis in, 509–510

Apert's syndrome, 820

Apgar score, as cerebral palsy predictor, 292

Aplastic anemia, congenital syndromes with, 548–552

Appropriate-for-gestational age, 326 Arachidonic acid metabolites, in labor control, 266–267 Arachnoid cysts, 809

Arousal, in preterm infants, early pain experience and, 373

Arrhythmias, cardiac, hydrops fetalis in, 1013, 1020–1022

Arteriovenous malformations, of central nervous system, 804 of umbilical cord, 969

Arthrogryposis, 998-1000

Ascites, in hydrops fetalis, 1008-1010

Ascorbic acid (vitamin C), metabolism and requirements of, in micropremies, 96–97

Asphyxia, as cerebral palsy antecedent, 292

fluid and electrolyte disorders in, in micropremies, 132

thrombocytopenia in, 666

Assisted reproductive technology,

economic issues in, 491 multiple gestations in, outcome of, 347– 350, 356–357

Ataxia-pancytopenia syndrome, bone marrow failure in, 547

Atelosteogenesis, 996

Atrial measurement, in ventriculomegaly, 797–799

Attrioventricular septal defect, 840–843 Attention, in preterm infants, early pain experience and, 373

Autonomic function, in very low-birth weight infants, pain effects on, 365

Bacterial vaginosis, preterm birth in, 270 *Bacteroides* infections, preterm birth in, 269 Ballantyne syndrome, 879 Banana sign, of spina bifida, 793–795 Barth syndrome, bone marrow failure in,

Battelle Developmental Inventory, in very low-birth weight infant evaluation,

low-birth weight infant evaluation, 391 Beckwith-Wiedemann syndrome, 965

Beckwith-Wiedemann syndrome, 965
Behavioral development, in very low-birth
weight infant survivors, family and
social factors affecting, 444–445
pain experience effects on, 371–372

Biliary disorders, 915 Bilirubin, as antioxidant, 174–175 excess of. See *Hyperbilirubinemia*. metabolism of, lipid emulsions and, 62–63

physiology of, in micropremies, 173–174 Biology, in outcome of extremely low-birth weight infants. See Extremely low-birth weight infants, outcome of, biology versus environment. Biopsy, bone marrow, approach to, 750–751 in neutropenia, 584–585 in thrombocytopenia, 669

Biotin, metabolism and requirements of, in micropremies, 103–104

Birth weight, as survival predictor, 255–256

extremely low. See Extremely low-birth weight infants.

in multiple gestations, 351–352 discordance in, 352–353 versus development, 437–439, 444 versus gender, 326–327

versus gestational age, 326-327

versus limitations, 446 versus medical costs, 485–489

very low. See Very low-birth weight infants.

Bladder, anomalies of, in cloacal exstrophy, 925–926, 952, 960–962

exstrophy of, 925-926, 952, 962-963 obstruction of, 930-933

Bleeding, vaginal, as cerebral palsy antecedent, 290

Bleeding time test, 643-654

reference value for, 647

abnormalities of, causes of, 649–651 gestational age and, 651 hemostasis physiology and, 644–646 historical background of, 643–644 interpretation of, 647–651 procedure for, 646–647

Blood pressure, in very low-birth weight infants, pain effects on, 365 Body stalk anomaly, 949, 952–954 Bone, anomalies of. See Skeletal anomalies.

Bone marrow, biopsy of, approach to, 750–751

in neutropenia, 584–585 in thrombocytopenia, 669 erythropoiesis in, 510–511

failure of, 543-558

approach to, 545, 548 congenital conditions associated with,

543–547 differential diagnosis of, 548 in amegakaryocytic thrombocytopenia,

547, 553 in ataxia-pancytopenia syndrome, 547

in Barth syndrome, 547 in Diamond-Blackfan anemia, 547,

in Down syndrome, 546, 551-552

in Dubowitz syndrome, 546 in dyskeratosis congenita, 550–551

in Fanconi's anemia, 546, 548–550

in infantile genetic agranulocytosis (Kostmann's syndrome), 553

in IVIC syndrome, 547 in Pearson's syndrome, 547 in Seckel's syndrome, 546 in Shwachman-Diamond syndrome, 546, 550

in thrombocytopenia-absent radius syndrome, 547, 554-555 in WT syndrome, 547

Bone mineral metabolism, in micropremies, 147–170

after discharge, 162–164 before discharge, 157–162 fetal development and, 148–153 in first weeks, 157

nutrition and, 153–157 with human milk feeding, 242–243

Bowel. See also *Small intestine*. echogenic, in ultrasonography, 774–775, 912–914

Brain, arteriovenous malformations of, 804 choroid plexus cysts of, 778–780, 802– 803

corpus callosum agenesis in, 799–800 development of, **303–323** 

essential fatty acids for, 85–86 imaging of, functional, 318–319 in intraventricular hemorrhage, 311 in periventricular leukomalacia,

312–314 in ventricular enlargement, 314–315 magnetic resonance. See Magnetic resonance imaging, of brain. predictive value of, 311–316

strategies for, 305–309 structural, 316–318 timing of, 309–310

ultrasonographic. See *Ultrasonogra*phy, cranial.

injury during, 304–305 pain experience effects on, 371–372

vitamin B<sub>8</sub> in, 101 erythropoietin in, 533–535

glucose requirements of, 11–12 hemorrhage of. See also *Intraventricular hemorrhage*. essential fatty acid effects on, 83

holoprosencephaly of, 800–802 hydranencephaly of, 805–806 hypoglycemia effects on, 11–12 hypoxia of, essential fatty acid effects

inadequate perfusion of, as cerebral palsy antecedent, 294 neural tube defects of, 791–795 porencephaly of, 806

posterior fossa anomalies of, 806-809 schizencephaly of, 806

tumors of, 804

ventriculomegaly of. See Ventriculomegaly.

white matter damage of. See Cerebral palsy, antecedents of; Periventricular leukomalacia.

Braxton-Hicks contractions, 265
Breast milk. See *Milk*, *human*.
Bronchoalveolar lavage fluid, granulocyte colony-stimulating factor in, 562
Bronchopulmonary dysplasia, anemia in, erythropoietin in, 687, 689
eosinophilia in, 618
essential fatty acid effects on, 81–82
fluid and electrolyte disorders in, in micropremies, 141–142

impact of, in adolescence, 428–431 Bronchopulmonary sequestration, 881–886 Burst-forming unit–erythroid cells, 512–513

Calcification, papillary muscle, 776–778
Calcium, homeostasis of, in fetus, 149–150
in micropremies, 153–157
vitamin D in, 106–108
in enteral feeding, 155–157
in parenteral nutrition, 154
Calorimetry, in energy expenditure
measurement, 183–184
Campomelic dysplasia, 990–991
Candidiasis, congenital, eosinophilia in,
614–615

Cantrel-Haller-Ravitch syndrome (pentalogy of Cantrell), 952, 958–960 Capillary leak syndrome, in micropremies,

Carbohydrate:fat ratio, in parenteral nutrition, protein metabolism and, 30

Carbon dioxide, measurement of, in indirect calorimetry, 183–184 Cardiac arrhythmias, hydrops fetalis in, 1013, 1020–1022

Cardiac output, disorders of, in micropremies, 133–134

Cardiovascular system, disorders of, hydrops fetalis in, 1013, 1020–1022 erythropoietin function in, 530–531 Carnitine, in lipid emulsions, 60–61,

210–211

Carotenoids, metabolism and requirements of, in micropremies, 104–106

Cartilage anomalies. See Skeletal anomalies. Catheters, intravascular, dysfunction of, assessment of, 751

thrombosis due to, 626–627 CD34 molecule, of hematopoietic

progenitor cells, 512–513 Central nervous system. See also *Brain*.

anomalies of, **791–812**arteriovenous malformations, 804
choroid plexus cysts, **778–780**, 802–803
corpus callosum agenesis, **799–800**holoprosencephaly, 800–802
hydranencephaly, 805–806
intracranial tumors, 805

neural tube defects, 791–795 porencephaly, 806 posterior fossa, 806–809 schizencephaly, 806 ventriculomegaly, 795–799 erythropoietin in, 533–535 Cephalocele, 792 Cephalopagus, 1042–1043

Cerebellum, malformations of, 807–809 Cerebral palsy, **285–302** 

antecedents of, asphyxia, 292 cerebral perfusion abnormalities, 294 delivery site effects on, 292–293 detection of. See *Brain*, development of, imaging of.

imaging of.
fetal growth restriction, 288
genetic factors, 286–287
hyperbilirubinemia, 294–295
intrauterine infections, 289–290
neonatal sepsis, 294
placental abruption, 290
preeclampsia, 288
prepregnancy factors, 287
respiratory distress syndrome, 293
thyroid hormone abnormalities, 287
twin gestation, 287–288
vaginal bleeding, 290
definition of, 285

functional assessment of. See Functional outcome, of very low-birth weight infants, assessment of.

prevention of, antenatal magnesium sulfate in, 291–292 antenatal steroids in, 291

Cerebral ventriculomegaly. See Ventriculomegaly.

Cerebrospinal fluid, erythropoietin in, 535 Ceruloplasmin, deficiency of, 124–125 Cervicothoracic somite dysplasia, 939 Cervix, ripening of, in preterm labor, 273–275

Cesarean section, in multiple gestations, 353

Chemokines, reference ranges for, 604–608 Chiari II malformations, 793–795 Child care, in outcome of very low-birth

weight infants, 445, 447 Chlamydia infections, in chronic lung disease pathogenesis, 720 preterm birth in, 268–270

Chondrodysplasias. See *Skeletal anomalies*. Chondroectodermal dysplasia, 994–995 Chorioamnionitis, as cerebral palsy antecedent, 289–290

Choroid plexus cysts, 778–780, 802–803 Chromosomal abnormalities, echogenic bowel in, 774–775, 913

hydrops fetalis in, 1013–1014, 1022 in abdominal wall anomalies, 949 in umbilical cord anomalies, 949 renal abnormalities in, 939–940 thrombocytopenia in, 662 ultrasonography in. See *Ultrasonography*, in chromosomal abnormalities.

Chronic lung disease, cerebral palsy and,

293
pathogenesis of, 717–731
cytokines in, 719, 723–724
granulocyte colony-stimulating factor
in, 726–727
granulocyte-macrophage colony-stimulating factor in, 724–726
infections in, 720–721
neutrophils in, 718–724

infections in, 720–721 neutrophils in, 718–724 oxyradicals in, 723 proteases in, 721–723 surfactant dysfunction in, 724

Chylomicrons, artificial, in lipid emulsions, 58

Chylothorax, fetal, 886–893 Circumcision, pain response in, 369 Cisterna magna enlargement, 806–807 Cleft lip or palate, 823–829

Cleft sternum, in pentalogy of Cantrell, 952, 958–960

Cloacal exstrophy, 925–926, 952, 960–962 Cloacal membrane, persistent, 931 Coagulation, physiology of, 623–625

vitamin K in, 111

Coarctation, aortic, 845–847 Cobalamin (vitamin B<sub>12</sub>), metabolism and requirements of, in micropremies, 101–102

Cognitive dysfunction, in intraventricular hemorrhage, 311

Cognitive function, pain experience effects on, 371–372

Colitis, necrotizing. See Necrotizing enterocolitis.

Collagenase, in chronic lung disease pathogenesis, 722–723

Colon, disorders of, 911-912

Combined immunodeficiency syndrome, eosinophilia in, 616

Communication skills, in very low-birth weight infant survivors, assessment of, 383–386, 395, 397 family and social factors affecting,

444-445

Competitive repopulating units, in erythropoiesis, 512

Complement, in chronic lung disease pathogenesis, 718–719

Congenital anomalies, abdominal wall, 947–978

cardiac. See Heart disease, congenital. central nervous system, 791–812 craniofacial, 813–837 gastrointestinal, 901–920 hydrops fetalis, 1007–1031 in multiple gestations, 1033–1046 neck, 813–837 sonographic markers of, 761–789 upplied cord, 947, 978

umbilical cord, 947–978 urologic, 921–945

Conjoined twins, 1042–1045 Contractions, Braxton-Hicks, 265

Contractures, joint, in arthrogryposis, 998–1000

Copper, metabolism and requirements of, in micropremies, 123–125

Cord blood, granulocyte colonystimulating factor in, 560–561 Corpus callosum, agenesis of, 799–800

Corticogenesis, imaging of, 316–318 injury effects on, 304–305

Corticosteroids, antenatal, in cerebral palsy prevention, 291 in thrombocytopenia, 670

Corticotropin-releasing hormone, in labor control, 265–266

Cortisol, in labor control, 265–266 Cranial ultrasonography. See Ultrasonography, cranial.

Cranioarachischis, 792 Craniofacial anomalies, 813–837

evaluation of, in skeletal anomalies, 982 in achondrodysplasia, 983 in achondrogenesis, 988–990 in campomelic dysplasia, 990–991 in holoprosencephaly, 801 in thanatophoric dysplasia, 985

syndromes associated with, 814–817, 820 Craniopagus, 1042–1043 Craniosynostoses, 820

Crouzon's syndrome, 820 Cyllosmas (body stalk anomaly), 949,

Cyllosmas (body stalk anomaly), 949, 952–954

Cyst(s), adenomatoid, of lung, 875–881, 1023–1024 arachnoid, 809

choroid plexus, 778-780, 802-803 kidney, 933-937

mesenteric, 916 omental, 916

umbilical cord, 967–968

Cystic adenomatoid malformation, of lung, 875–881, 1023–1024

Cystic fibrosis, meconium ileus in, 913 Cystic hygroma, 831–833

in achondrogenesis, 988 ultrasonography of, 763

Cytidiltransferase, essential fatty acid interactions with, 79–80

Cytokines, as preterm birth markers, 271–273

hematopoietic, in necrotizing enterocolitis. See Necrotizing enterocolitis. in chronic lung disease pathogenesis, 723-724 Cytokines (Continued) in labor control, 267 Cytomegalovirus infections, hydrops

fetalis in, 1015-1016

Cytopenias. See also specific disorders. in bone marrow failure. See *Bone marrow*, *failure of*.

Dandy-Walker syndrome and variants, 807–809

Death, due to lipid emulsions, for micropremies, 61–62

fetal, cerebral palsy risk in surviving twin, 288

in multiple gestations, 354–355 in hydrops fetalis, 1010–1011

neonatal, in multiple gestations, 355 Delivery, preterm. See *Preterm labor and* birth.

Dentinosteogenesis imperfecta, 994 Deuterium-labeled water, in energy expenditure measurement, 184–185

Diabetes mellitus, maternal, neonatal thrombosis in, 626

Diamond-Blackfan anemia, bone marrow failure in, 547, 552–553

Diaphragmatic hernia, 866–875 antenatal history of, 869–870 antenatal management of, 870–874 epidemiology of, 866 pathophysiology of, 866–867 peritoneopericardial, 952, 958–960 postnatal management of, 874–875

prenatal diagnosis of, 867–869 prognosis of, 870

Diastrophic dysplasia, 995–996 Digoxin, in twin-twin transfusion, 1036 Diplegia, in cerebral palsy, functional motor outcome in, 385–387

Direct calorimetry, in energy expenditure measurement, 184

Disablement, models of, 382–383, 395 Disseminated intravascular coagulation, thrombocytopenia in, 664

Diuresis, in bronchopulmonary dysplasia, 142

in respiratory distress syndrome, 138, 140

Double-inlet ventricle, 858–859 Double-outlet right ventricle, 854–856 Doubly labeled water method, in energy

expenditure measurement, 184–185 Down syndrome. See *Trisomy 21 (Down syndrome)*.

Drugs, bleeding time test interpretation and, 650

eosinophilia due to, 617–618 thrombocytopenia due to, 663–664 Dual x-ray absorptiometry, in fetus, 150–153

in micropremies, 158-159, 161

Dubowitz syndrome, bone marrow failure in, 546

Duodenum, atresia of, 907 disorders of, 908–910

Dyskeratosis congenita, bone marrow failure in, 550–551

Eagle-Barrett syndrome, 931 Ear, anomalies of, 816, 829

Ebstein's anomaly, 847–849

Echocardiography, in thrombosis, 628–629 Echogenic bowel, in ultrasonography,

774-775, 912-914

Economics, of prematurity, 483–497 after neonatal period, 491–493 cost reduction in, 493 direct medical costs, 491–492

nonmedical costs, 492 in neonatal period, 485–491 assisted reproductive technology

effects on, 491 cost-effectiveness, 490–491 cost predictors in, 488–489

cost reduction in, 489–491 intensive care unit rationing in,

489–490 nonmedical costs, 488 parental time, 488 prenatal care effects on, 490 regionalized care in, 490 versus birth weight, 485–488 methodologic issues in, 484–485

terminology of, 484–485 Edema, in micropremies, 132–135

> in asphyxia, 132 in capillary leak syndrome, 134 in immature organ development, 132–134

in sepsis syndrome, 132 treatment of, 134–135

pulmonary. See Pulmonary edema.

Education, maternal, in outcome of very low-birth weight infants, 443–444, 448–449

multiple gestation rate in, 347–350 special, prematurity-associated, 492–494 Edwards' syndrome. See *Trisomy 18* 

(Edward's syndrome). Eicosanoids, synthesis of, essential fatty acids in, 80

Elastase, in chronic lung disease pathogenesis, 722

Electrolytes, metabolism of. See Fluid and electrolyte metabolism.

Ellis-van Creveld syndrome, 994-995

Emulsions, lipid. See *Lipids, emulsions of*. Encephalocele, 792

in Meckel-Gruber syndrome, 937–939 Endothelial cells, erythropoietin function in, 530–531

Endotoxin, as cerebral palsy antecedent, 289

Energy, expenditure of, **181–195** factors affecting, 185–188 in micropremies, 188–190 versus requirements, estimation of, 189, 191–192

in protein metabolism, 202–205 measurement of, 183–185

versus requirements, balance of, 181–183

intake of, metabolizable, estimation of, 182

requirements of, versus energy expenditure, balance of, 181–183 versus expenditure, estimation of, 189,

191–192

stores of, in neonate, 24–25 Enteral feeding. See also *Milk*, *human*.

in micropremies, 221–234 administration methods for, 227 gut development and, 222–225 long-term aspects of, 229 milk selection for, 226–227 minerals in, for bone growth, 155–157

monitoring of, 229 protein metabolism in, 28–29

regime for, 225–226 trophic feeding in, 227–229

vitamin concentrations in, 98 Enterocolitis, necrotizing. See Necrotizing enterocolitis.

Enterocytes, erythropoietin in, 531–533 Environment. See also *Family factors and social support*.

in outcome of extremely low-birth weight infants. See Extremely lowbirth weight infants, outcome of, biology versus environment.

Eosinophil(s), adhesion of, 604–607 formation of, 604

life span of, 607 migration of, 604–607 physiology of, 603–607

reference ranges for, 607–610

Eosinophilia, 603–622 approach to, 618–619 causes of, 610

drug-induced, 617–618 evaluation of, approach to, 746

familial, 616–617 in anabolic state, 617

in bronchopulmonary dysplasia, 618 in congenital heart disease, 618

in congenital neutropenia with eosinophilia, 614 in eosinophilic leukemia, 613-614 in eosinophilic leukemoid reaction, 612-613

in hypereosinophilic syndrome, 610–612 in immunodeficiency, 616

in infections, 614–615

in thrombocytopenia-absent radius syndrome, 614

physiology of, 603-607

versus normal eosinophil concentrations, 607–610

Eosinophilic leukemia, 613–614 Eotaxin, reference ranges for, 605–608 Epispadias, in bladder exstrophy, 952, 962–963

Erythroblasts, in bone marrow, 510 in liver, 510

in yolk sac, 509

primitive versus definitive, 508 Erythrocyte(s), developmental disorders of,

552–553 formation of. See *Erythropoiesis*.

transfusions of, approach to, 734–735 Erythropoiesis, **507–526** definition of, 507

extramedullary, 511 in aorta, 509–510

in bone marrow, 510–511

in liver, 510 in yolk sac, 509

switching from fetal to adult, erythrocyte characteristics, 514

hemoglobin chain expression, 514–516 precursors, 511–514 primary site, 508–511 primitive to definitive, 507–508

regulation, 516–520 Erythropoietin, abnormalities of, 527

concentrations of, 517 deficiency of, in physiologic anemia, 682–687

developmental changes in, 516–520 distribution of, 517

gene of, regulation of, 519–520

in transfusions, 527-529

nonerythropoietic functions of, **527–541** in cardiovascular system, 530–531 in central nervous system, 533–535 in gastrointestinal system, 531–533

overview of, 529–530 production of, 517

production of, 517 replacement of, 681–696 advantages of, 692–693

approach to, 741–743 in hyporegenerative anemias, 687–690 in micropremies, 120–121

in necrotizing enterocolitis, 700–703 in physiologic anemia, 682–683 clinical studies of, 683–687 pharmacokinetics of, 690–691 Erythropoietin (Continued) side effects of, 691 transfusion requirements and, 683-688, 691-692 structure of, 516 Esophagus, atresia of, 903-905 disorders of, 901-905 embryology of, 901-903 motility of, development of, 223 Essential fatty acids. See Fatty acids, essential. Ethnic factors, in outcome of very low-birth weight infants, 440, 444, 446, 449-450 Exchange transfusions, for hyperbilirubinemia, 176-178 Exencephaly, 792 Exomphalos (omphalocele), 917-918, 952, 963-965 in cloacal exstrophy, 952, 961-962 in trisomies, 764 Exstrophia splanchnica (cloacal exstrophy), 925-926, 952, 960-962 Exstrophy-epispadias complex (bladder exstrophy), 925-926, 952, 962-963 Extracorporeal membrane oxygenation, in diaphragmatic hernia, 874-875

Extremely low-birth weight infants,

growth of, evaluation of, in

adolescence, 421-428 outcome of, biology versus environment and, 461-481 articles reviewed, 463-464 conceptual issues in, 476-478 conclusions of, 470-473 importance of, 462 meaning of, 461-462 mediation and moderation models, 471-472 methodologic issues in, 476 multiple risk models, 472-473 protective factors in, 473-475 studies reviewed, 463-470 respiratory health in adolescence, 428-431 survival rates, 255-262

Facial anomalies. See *Craniofacial anomalies*. Factor V Leiden mutation, thrombosis in, 629–631

Family factors and social support. See also *Parents*.

in outcome of very low-birth weight infants, 433–459
data collection and management, 435–437
research problem parameters, 433–435

Eye, anomalies of, 814-815, 821-822

study goals, 435 Fanconi's anemia, bone marrow failure in, 546, 548-550 thrombocytopenia in, 662 Fasting, protein metabolism in, in full-term neonates, 27 Fatty acids, essential, 71-93 brain injury and, 83 deficit of, 84-86 fetal stores of, 73-75 in eicosanoid production, 80 in formulas, 87 in human milk, 86-87 infections and, 82-83 lipid membrane properties and, 78-79 metabolism of, 71-73 molecular biology of, 75-77 oxidant stress from, 83-84 pulmonary disease and, 81-82 supplementation of, 84-87 surfactant composition and, 79-80 synthesis of, in marine environment, in lipid emulsions, 57-58 peroxidation of, 64-65

results, 437-452

peroxidation of, 64–65
Feeding, of very low-birth weight infants.
See Growth, of very low-birth weight
infants, in intensive care unit.
Fetal echogenic gut, 225
Fetofetal transfusion syndrome. See Twin-

twin transfusion syndrome.

Fetus(es), bone development in, 148–153
evaluation of, 150–153
factors affecting, 148–150
death of, cerebral palsy risk in surviving

twin, 288 in multiple gestations, 354–355 essential fatty acid stores in, 73–75 growth of, in multiple gestations, 351– 352 restriction of, cerebral palsy in, 288

inflammatory response of, as cerebral palsy antecedent, 289–290 multiple. See *Multiple gestations*. reduction of, in multiple gestations, 357–358

vitamin D metabolism in, 106 Fibrinolysis, physiology of, 623–625 Fibronectin, fetal, as preterm birth marker, 271–272

Fibrosis, pulmonary, in chronic lung disease, 721–724 Filagrastim. See *Granulocyte colony*-

stimulating factor, therapeutic use of. Fistula, tracheoesophageal, 903–905 Fluid and electrolyte metabolism, in micropremies, 131–146

disorders of, bronchopulmonary dysplasia, 141–142 edema, 132–135 hyperosmolar state, 135–138 hyponatremia, 142–143 pulmonary edema, 138–140 respiratory distress syndrome. See Respiratory distress syndrome. shock, 132–135

Folic acid, metabolism and requirements of, in micropremies, 102–103

Formulas, for micropremies, 226–227 after discharge, 229 essential fatty acids in, 87 minerals in, for bone growth, 156–157, 159, 161, 163–164

vitamin concentrations in, 99 for very low-birth weight infants. See Growth, of very low-birth weight infants, in intensive care unit.

Fraccaro type of achondrogenesis, 988, 990 Fractures, in congenital anomalies, 980 in hypophosphatasia, 987–988 in osteogenesis imperfecta, 992, 994 Free radicals, in chronic lung disease pathogenesis, 723

Functional Independence Measure for Children, in very low-birth weight infant evaluation, 390–394

Functional outcome, of very low-birth weight infants, 381–401 assessment of, cohort studies of, 390–395

communicative skills, 383–386, 395, 397 developmental skills, 383–386

disability status, 395–396 disablement models for, 382–383 milestones in, 388–389 motor skills, 383–388

Funic presentation, of umbilical cord, 970–971

Gallbladder disorders, 915
Gardnerella infections, preterm birth in, 269
Gastric emptying, in micropremies, 224
Gastroesophageal reflux, in micropremies, 223

Gastrointestinal tract, disorders of, 901–920 abdominal wall anomalies in. See

Abdominal wall anomalies. anorectal, 912 biliary, 915 colonic, 911–912 cysts, 916 duodenal, 908–910 echogenic bowl, 912–914 esophageal, 901–905 gallbladder, 915 gastric, 905–907 hepatic, 915
ileal, 910–911
jejunal, 910–911
pancreatic, 915–916
situs inversus, 916
small intestinal, 907–908
erythropoietin function in, 531–533
ontogeny of, 222–225
Gastroschisis, 918–919, 954–958
Gender, versus birth weight, 326–327
Genes, essential fatty acid interactions
with, 75–77

Genetic factors, in cerebral palsy, 286–287 Germinal matrix, hemorrhage into. See Intraventricular hemorrhage.

Gestational age, as survival predictor, 255–259

bleeding time test and, 651 versus birth weight, 326–327 Globin chains, of hemoglobin, switching from fetal to adult, 514–516

Glucose, administration of, protein metabolism in, 29–30 requirements for, 207–208

homeostasis of, in micropremies, 1–22 evaluation of, 1–5 hyperglycemia and, 13–18 hypoglycemia and, 8–13 lipid emulsion effects on, 62 metabolism in, 1–2 normal levels in, 8–9 production of, 2–5 use of, 5–8

Glucose transporters, in micropremies, 5–6, 15

Glutamine, in protein accretion enhancement, 47–49

Glutathione peroxidases, selenium in, 125–126

Goiter, 834

Gonorrhea, preterm birth in, 268 Granulocyte(s), transfusions of, approach to, 737

Granulocyte colony-stimulating factor, 559–576

actions of, 560–564 cells producing, 560 distribution of, 564–565 historical background of, 559 in amniotic fluid, 561–562 in bronchoalveolar lavage fluid, 562 in chronic lung disease pathogenesis, 726–727

in fetal tissues, 564–565 in human milk, 562–564 in neonatal tissues, 564–565 in placenta, 564 in serum, 560–561 in urine, 562

in cord blood, 560-561

Granulocyte colony-stimulating factor (Continued)

receptors for, distribution of, 564–565 functions of, 566–567

therapeutic use of, 567–570 approach to, 739–741

benefits of, 570

in infections, 567-568

in necrotizing enterocolitis, 701, 704 in neutropenia, 588–590

maternal, before delivery of extremely low-birth weight infants, 568–570 pharmacokinetics of, 566–567

Granulocyte-macrophage colonystimulating factor, in chronic lung disease pathogenesis, 724–726

therapeutic use of, in labor control, 267 in necrotizing enterocolitis, 701, 703–704

in neutropenia, 590

Gross Motor Functional Classification System, disablement models of, 382–383

Growth, catch-up, in very low-birth weight infants, 339–343

energy requirements for, 188 estimation of, 191–192

goals of, in parenteral nutrition, 211–214 intrauterine, in multiple gestations, 351–352

normal, 325-327

restriction of, cerebral palsy in, 288 in micropremies, 225 thrombocytopenia in, 665 ultrasonography of, 769

of very low-birth weight infant survivors, assessment of, in adolescence, 421–428

of very low-birth weight infants, in intensive care unit, 325–345 clinical observations of, 328–333 current perspective on, 339–341 multicenter prospective cohort study of, 333–339 research challenges on, 341–343

versus normal fetal growth, 325–327 with human milk feeding, in micropremies, 239–243

Growth hormone, in protein accretion enhancement, 47

Head, anomalies of. See Craniofacial

Health related quality of life. See Quality of

Health services and insurance, in outcome of very low-birth weight infants, 441, 445, 447–450

Hearing limitations, in very low-birth weight infant survivors, family and social factors affecting, 446–447 Heart, absence of, in twins, 1038–1042 immaturity of, fluid and electrolyte disorders in, in micropremies, 133–134 papillary muscle calcification in, 776–778 transplantation of, in hypoplastic left heart syndrome, 845

Heart disease, congenital, 839–863
aortic coarctation, 845–847
atrioventricular septal defect, 840–843
double-inlet ventricle, 858–859
double-outlet right ventricle, 854–856
Ebstein's anomaly, 847–849
eosinophilia in, 618
erythropoietin in, 690
hydrops fetalis in, 1013, 1020–1022
hypoplastic left heart syndrome,
843–845

hypoplastic right ventricle, 851 tetralogy of Fallot, 851–854 transposition of great arteries, 856–858 truncus arteriosus, 859–861 ventricular septal defect, 849–851

Heart rate, in very low–birth weight infants, pain effects on, 365

Height, of very low-birth weight infant survivors, in adolescence, 425–428 Hemangioblasts, in yolk sac, 509

Hematocrit, in erythrocyte transfusion decisions, 734–735

Hematology, bleeding time, 643–654 bone marrow failure syndromes, 543– 558

chronic lung disease and, 717–731 eosinophilia, 603–622, 746 erythropoiesis, 507–526 erythropoietin. See *Erythropoietin*.

granulocyte colony-stimulating factor. See Granulocyte colony-stimulating factor.

hematopoietic growth factors, necrotizing enterocolitis and, 697–716 neutropenia. See *Neutropenia*.

procedures and practices, 733–753 bone marrow biopsy, 750–751 catheter placement assessment, 751 eosinophilia evaluation, 746 erythropoietin administration, 741–743 granulocyte colony-stimulating factor administration, 739–741

immune globulin administration, 737–739

neutropenia evaluation, 743–744 neutrophilia evaluation, 744–746 thrombosis evaluation, 747–750 thrombosis treatment, 751–753 transfusions, erythrocyte, 734–735 granulocyte, 737 platelet, 735–737

thrombocytopenia. See *Thrombocytopenia*. thrombosis. See *Thrombosis*.

Hematopoietic growth factors, in erythropoiesis, switching from fetal to adult, 513-514

Hemiacardia, in twins, 1039

Hemiplegia, in cerebral palsy, functional motor outcome in, 385-387

Hemoglobin, switching from fetal to adult, 514-516

Hemolytic disease, in Rh mismatch, erythropoietin in, 690 hydrops fetalis in, 1017, 1023 immune globulin in, 737-739

Hemorrhage. See also Intraventricular hemorrhage.

brain, essential fatty acid effects on, 83 Hemostasis, physiology of, 644-646 Heparin, in thrombosis, 631-632, 752-753

thrombocytopenia due to, 663-664 Hepatic nuclear factor-4α, in fatty acid metabolism, 76-77

Hernia, diaphragmatic, 866-875 peritoneopericardial, 952, 958-960

Hitchhiker thumb, in diastrophic dysplasia, 995

Holoprosencephaly, 800-802 HOX gene, mutations of, multiple anomalies in, 545

Human milk. See Milk, human.

Hyaline membrane disease, essential fatty acid effects on, 81

Hydranencephaly, 805-806

Hydrocephalus, in ventriculomegaly, 795-799

Hydronephrosis, 21, 775-776, 927-929 Hydrops fetalis, 1007-1031

counseling on, 1025-1027 definition of, 1007-1010

etiology of, 1012-1013

idiopathic, 1019 immune, 1012

in achondrogenesis, 988 in anemia, 1016-1017, 1023

in bronchopulmonary sequestration, 884-885

in cardiovascular disorders, 1013, 1020-

in chromosomal abnormalities, 1013-1014, 1022 in cystic adenomatoid malformation,

878-879, 1023-1024 in genitourinary malformations, 1018,

in infections, 1014-1016, 1022-1023

in thoracic lesions, 1017-1018, 1023-1024 in tumors, 1018, 1024

in twin-twin transfusion syndrome, 1018-1019, 1024-1025 maternal complications in, 1025

morbidity in, 1011 mortality in, 1010-1011 prognosis for, 1019-1025 significance of, 1010-1011 syndromes associated with, 1014 ultrasonography of, 763

Hydrothorax, 886-893

in hydrops fetalis, 1008-1010, 1023-1024 15-Hydroxyprostaglandin dehydrogenase, in labor control, 266-267

Hyperbilirubinemia, as cerebral palsy antecedent, 294-295

in micropremies, 171-179 benign neonatal, 174

developmental considerations in, 174-

diagnosis of, 175-176 outcome of, 178 pathophysiology of, 173-174 risks of, 174

treatment of, 171-173, 176-178 Hypereosinophilia, with

hyperimmunoglobulin E, 616 Hypereosinophilic syndrome, 610-612

Hyperglycemia, in micropremies, 13-18 definition of, 13 glucose administration strategies and,

incidence of, 13-14 pathophysiology of, 15 treatment of, 16-18

Hyperglycemic clamp technique, in glucose metabolism evaluation, 3

Hyperkalemia, nonoliguric, in micropremies, 136-137

Hyperosmolar state, in micropremies, 135-138

Hypersensitivity, to pain, in preterm infants, 367

Hypertelorism, 814, 821-822 in arthrogryposis, 998

Hypertension, maternal, neonatal thrombocytopenia in, 665, 741 pulmonary, lipid emulsions and, 63-64

Hyperventilation, as cerebral palsy antecedent, 294

Hypocalcemia, in micropremies, 154 of prematurity, 107

Hypochondrogenesis, 990

Hypoglycemia, in micropremies, 8–13 definition of, 8-10 incidence of, 10 pathophysiology of, 10-12

treatment of, 12-13 Hyponatremia, of prematurity, 142-143 Hypophosphatasia, skeletal anomalies in,

987-988 Hypoplastic left heart syndrome, 843-845 Hypoplastic right ventricle, 851

Hypotelorism, 814, 822

Hypothalamic-pituitary-adrenal axis, in labor control, 265-266

Hypothyroxinemia, cerebral palsy in, 287 Hypoxemia, as cerebral palsy antecedent, 294

Hypoxia, brain, essential fatty acid effects on, 83

Hypoxia-inducible factor, in erythropoietin gene regulation, 519–520

Ileum, disorders of, 910–911
Imaging. See Magnetic resonance imaging;
Ultrasonography.

Immune globulin, intravenous, approach to, 737–739

in neutropenia, 586–588 in thrombocytopenia, 670

Immunodeficiency, eosinophilia in, 616 Immunoglobulin G, in platelets, in

thrombocytopenia, 669

Indirect calorimetry, in energy expenditure measurement, 183–184

Indomethacin, in twin-twin transfusion, 1036

thrombocytopenia due to, 663

Infantile genetic agranulocytosis (Kostmann's syndrome), bone marrow failure in, 553

Infections, eosinophilia in, 614–615 essential fatty acid effects on, 82–83 genital, as cerebral palsy antecedent, 289–290

preterm birth in, 268-270

granulocyte colony-stimulating factor in, 567–568

immune globulin in, 737-739

in chronic lung disease pathogenesis, 720–721

intrauterine, hydrops fetalis in, 1014–1016, 1022–1023

Infertility treatments, multiple gestations in, outcome of, 347–350, 356–357

Inflammation, fetal response to, as cerebral palsy antecedent, 289–290

genital, preterm birth in, 268-270 Inflammatory mediators, in labor control, 267

Iniencephaly, 793

Insulin, in micropremies, in glucose metabolism, 4, 15

in hyperglycemia, 17-18

in protein accretion enhancement, 45,

resistance to, 207-208

Intake, dietary, energy expenditure related to, 186

Intensive care unit, care rationing in, 489–490

economics of. See Economics, of prematurity. growth in. See Growth, of very low-birth weight infants, in intensive care unit.

Interleukin(s), as preterm birth markers, 271–273

in chronic lung disease pathogenesis, 723

in labor control, 267

in necrotizing enterocolitis pathogenesis and treatment, 701, 704–710

Interleukin–11, in thrombocytopenia, 670 Intestine, necrotizing enterocolitis of. See *Necrotizing enterocolitis*.

Intracranial pressure, in very low-birth weight infants, pain effects on, 365 Intrauterine growth. See *Growth*,

intrauterine.

Intravenous therapy, for fluid and electrolyte disorders, in micropremies, in hyperosmolar state, 137–138

in patent ductus arteriosus, 140 in shock, 134-135

nutritional. See *Parenteral nutrition*. Intraventricular hemorrhage, 304

imaging of, for outcome prediction, 311 types of, 315–316 ultrasonography in, 305–307, 310

Intrinsic factor, 101–102

Intubation, for enteral feeding, in micropremies, 227

Iodine, metabolism and requirements of, in micropremies, 126–127

Iron, metabolism and requirements of, in micropremies, 119–121

supplementation of, in erythropoietin therapy, 743

Ischiopagus, 1044

IVIC syndrome, bone marrow failure in, 547

Jaundice, in micropremies, 171–179 developmental considerations in, 174–175

> diagnosis of, 175-176 lipid emulsion use in, 62-63

> outcome of, 178 pathophysiology of, 173-174

physiologic, 174

risks of, 174 treatment of, 171–173, 176–178

Jejunum, disorders of, 910–911

Jeune's syndrome (asphyxiating thoracic dystrophy), 991

Joint contractures, in arthrogryposis, 998–1000

Kernicterus, low-bilirubin, 172-173

Kidney, agenesis of, 924-925, 939 cvstic, 933-937

dysplasia of, in Meckel-Gruber syndrome, 937-939 multicystic, 933-935

embryology of, 921-922

function of, in amniotic fluid formation,

hydronephrosis of, 21, 775-776, 927-929 imaging of, 923-924

oxygen sensing in, in erythropoietin regulation, 520

Kostmann's syndrome, bone marrow failure in, 553

Labor and delivery, facilities for, versus cerebral palsy risk, 292-293 preterm. See Preterm labor and birth.

Langer-Saldino type of achondrogenesis,

Language development, in very low-birth weight infant survivors, assessment of, 383-386, 395, 397 family and social factors affecting,

444-445

Large-for-gestational age, 326

Lasers, in placental vessel ablation, for twin-twin transfusion, 1037-1038

in umbilical cord coagulation, in twin reversed arterial perfusion syndrome, 1041-1042

Lemon sign, of spina bifida, 793-795 Leucine kinetics, in low-birth weight infants, 31, 33-36

Leukemia, eosinophilic, 613-614 in congenital bone marrow failure syndromes, 545

> Down syndrome, 551-552 Fanconi's anemia, 549

Shwachman-Diamond syndrome, 550 Leukemoid reaction, eosinophilic, 612-613

Leukotrienes, in labor control, 266-267 Limb body wall complex, 949, 952-954 Limbs, defects of, 996-997. See also Skeletal

measurement of, in anomaly detection, 980-981

Limit of viability, in neonates, 259-260 Lip, anomalies of, 823-829

composition of, 57-58, 65

Lipid(s). See also Fatty acids.

emulsions of, for micropremies, 57-69, 208-210

antioxidants in, 84

bronchopulmonary dysplasia and, 81-82

carnitine supplementation in, 60-61,

essential fatty acids in, 84-86

hvaline membrane disease and, 81 infections and, 82-83

infusion rate for, 59 jaundice from, 62-63

maximal intake, 209-210

metabolism of, 58-61 minimal intake, 208

mortality and morbidity related to, 61-62

peroxidation in, 64-65 protein metabolism in, 30

pulmonary function and pulmonary vascular resistance and, 63-64

toxicity of, 209-210 peroxidation of, essential fatty acids and, 83-84

Lipid membranes, essential fatty acid effects on, 78-79

Lipomyelomeningocele, 793-795

Liver, disorders of, 915 erythropoiesis in, 510

oxygen sensing in, in erythropoietin regulation, 520

Löffler's syndrome, eosinophilia in,

Low-birth weight infants, extremely. See

Lung, chronic disease of. See Chronic lung

cystic adenomatoid malformation of, 875-881, 1023-1024

dysplasia of. See Bronchopulmonary dys-

edema of, in micropremies, 138-140 embryology of, 866, 881

immaturity of, fluid and electrolyte disorders in, in micropremies, 133-134 lipid emulsion effects on, 63-64

sequestration of, 881-886

thoracic anomalies effects on. See Thoracic anomalies.

McMaster studies, of quality of life, in very low-birth weight infants, 407-416

Macrophage colony-stimulating factor, therapeutic use of, in necrotizing enterocolitis, 704

Macrophage inflammatory proteins, reference ranges for, 605-608

Magnesium sulfate, antenatal, in cerebral palsy prevention, 291

Magnetic resonance imaging, of brain, functional, 317-318

in periventricular leukomalacia, in ventriculomegaly, 315

Magnetic resonance imaging (Continued) structural, 316–317 versus ultrasonography, 315–316 of cystic adenomatoid malformation, 876–878

Managed care, in prematurity. See Economics, of prematurity.

Mandible, anomalies of, 817, 829–831 Manganese, metabolism and requirements of, in micropremies, 127

Mean platelet volume, in thrombocytopenia, 667–668 Meckel-Gruber syndrome, 937–939

Meconium, obstruction from, 911–913 Megacystis-microcolon-intestinal

hypoperistalsis syndrome, 931–932 Megakaryocyte(s), developmental

disorders of, 553–555 Megaureter, 930 Megaurethra, 931–932

Menaquinones (vitamin K), metabolism and requirements of, in micropremies, 110–112

Meningocele, 792-795

Menkes' syndrome, copper deprivation in, 124

Mesenteric cysts, 916

Metabolic acidosis, as cerebral palsy antecedent, 294

Metabolic rate, resting, 182–183 Metabolism, in micropremies. See

Micropremies, nutrition and metabolism in.

Metallothionein, synthesis of, zinc in, 122 3-Methylhistidine, measurement of, in protein metabolism studies, 26

Microcephaly, 818 Micrognathia, 817, 829–831

Micropremies, nutrition and metabolism in, bilirubin, 63–64, **171–179** 

bone mineral, 147–170 electrolyte, 131–146

energy, 181–195 enteral, 221–234. See also Milk, human, for micropremies.

essential fatty acid, 71–93

glucose, 1–22 human milk in, 235–247

intravenous. See Parenteral nutrition.

lipid, **57–69**, 208–210 protein. See *Amino acids; Protein* 

metabolism.
trace element 119-129

trace element, 119-129 vitamin, 95-118

water, **131–146**Milestones, in functional outcome assessment, 388–389

Milk, human, for micropremies, 235–247 after discharge, 239–243 composition of, 235–236 essential fatty acids in, 86–87 fortifiers for, 226–227, 237–238 health benefits of, 243–244 minerals in, for bone growth, 156–157, 159, 161 nutrient intake determination in,

outcome data supporting, 238–239 practical aspects of, 236–238 versus formula, 226–227

vitamin concentrations in, 99 granulocyte colony-stimulating factor in, 562–564

Mineralization, bone. See Bone mineral metabolism.

Monocyte(s), granulocyte colonystimulating factor production in, 560

Morphine, for procedures, in very low-birth weight infants, 374 Motility, of gastrointestinal tract,

development of, 223–224 Motor skills, in very low-birth weight infants, assessment of, 383–388 family and social factors affecting,

444–445 Movement, fetal, in skeletal anomalies, 982–983

Multifetal pregnancy reduction, 357–358

Multiple gestations, 347–361 anomalies in, 1033–1046

conjoined twins, 1042–1045 twin reversed arterial perfusion syndrome, 1038–1042

twin-twin transfusion syndrome, 1018–1019, 1024–1025, 1033–1038 cerebral palsy risk in, 287–288

iatrogenic, prevention of, 357–358 maternal age and, 347–350

maternal education and, 347–350 outcomes of, 350–357

assisted reproductive technology and, 347–350, 356–357 delivery timing and, 353

fetal growth, 351–352 fetal mortality rates, 354–355

growth discordance, 352–353 very low-birth weight mortality and

morbidities, 355–356 zygosity and, 354 prevention of, 357–358

trends in, 347–350

MURCS association, 939

Mycoplasma infections, in chronic lung disease pathogenesis, 720

preterm high in 268–269

preterm birth in, 268–269 Myelomeningocele, 793–795

Myeloperoxidase, in chronic lung disease pathogenesis, 723

Myofibrillary protein degradation, measurement of, 38–39 Nasogastric tubes, for enteral feeding, 227 National Center of Medical Rehabilitation Research, disablement models of, 382–383, 395

Neck, anomalies of, 831–834 Necrotizing enterocolitis, **697–716** clinical features of, 698

course of, 698

essential fatty acid effects on, 82 etiology of, 698–700

hematopoietic growth factors and, 700-710

basic concepts of, 700–701 erythropoietin, 700–703

granulocyte colony-stimulating factor, 701, 704

granulocyte-macrophage colony-stimulating factor, 701, 703–704 interleukins, 701, 704–710

macrophage colony-stimulating factor, 701, 704

thrombopoietin, 701, 704 historical background of, 698

in enteral feeding, 227 in erythropoietin deficiency, 532–533

in intrauterine growth restriction, 225 incidence of, 698

significance of, 698 thrombocytopenia in, 665

Neonatal Facial Coding System, in pain assessment, 366–367

Neovascularization, erythropoietin in, 530–531

Neural tube defects, 791-795

Neuroimaging, See Magnetic resonance imaging, of brain; Ultrasonography, cranial

Neutropenia, 577-601

alloimmune, 583-584 approach to, 577-578 autoimmune, 583-584

bone marrow aspiration in, 584-585

causes of, 579, 581–583 chronic idiopathic, 589

classification of, 579, 581–583 congenital, with eosinophilia, 614

definition of, 578

evaluation of, approach to, 743–744 granulocyte colony-stimulating factor in,

739–741 granulocyte transfusions in, 737 immune globulin in, 737–739

in erythropoietin replacement, 691 laboratory testing in, 583–584

treatment of, antibiotics in, 585–586 granulocyte colony-stimulating factor

in, 588–590 intravenous immune globulin in, 586–

neutrophil transfusion in, 590-591

versus normal neutrophil levels, 578–580 Neutrophil(s), deficiency of. See

Neutropenia.

developmental disorders of, 553 in chronic lung disease pathogenesis,

718–724 consequences of, 721–724

control of, 724 cytokines in, 719, 723–724

infections and, 720–721 oxyradicals in, 723

proteases in, 721–723 stimuli for, 718–721

surfactant dysfunction in, 724 transfusions of, approach to, 737 in neutropenia, 590–591

Neutrophilia, evaluation of, approach to, 744–746

Niacin, metabolism and requirements of, in micropremies, 102

Nitrogen balance, in low-birth weight infants, 30–32

measurement of, 25–26 Noonan's syndrome, thrombocytopenia in,

Nose, anomalies of, 816, 823

Nuchal cord, 971–972 Nuchal thickening, ultrasonography of, 773–774

Nuchal transparency, in ultrasonography, 764–769

Nutrition, for very low-birth weight infants. See *Growth*, of very low-birth weight infants, in intensive care unit.

in micropremies. See Micropremies, nutrition and metabolism in.

Oligohydramnios, in Potter's syndrome, 923

in twin-twin transfusion syndrome, 1018–1019, 1024–1025

Omental cysts, 916

Omphalocele, 917–918, 952, 963–965 in cloacal exstrophy, 952, 961–962 in trisomies, 764, 917–918

Ontogeny, of gastrointestinal tract, 222–225 Orogastric tubes, for enteral feeding, 227 Osteochondrodysplasias. See *Skeletal* 

Osteogenesis imperfecta, 991–994

Osteopenia, in micropremies, 157–158, 162 Ovulation, induction of, multiple gestations in, 357

Oxidation, of lipids, essential fatty acids and, 83–84

Oxygen–18-labeled water, in energy expenditure measurement, 184–185

Oxygen consumption, in indirect calorimetry, 183–184

Oxyradicals, in chronic lung disease pathogenesis, 723

Pain, in very low-birth weight infants, 363–379

acute consequences of, 365 anesthesia for, 364-365 animal studies of, 372 arousal regulation and, 373 assessment of, 366-367 attention regulation and, 373 behavioral effects of, 371-372 long-term sequelae of, 369-371 management of, 374 neurodevelopmental effects of, 371-372 procedures causing, 363-365 self-regulation and, 373 short-term sequelae of, 367-369 Palate, anomalies of, 823-829 Pancreas, disorders of, 915-916 Pancytopenias, in bone marrow failure. See Bone marrow, failure of. Pantothenic acid, metabolism and requirements of, in micropremies, 103 Papillary muscle calcification, 776-778 Paraomphalocele (gastroschisis), 918-919, 954-958

Parathyroid gland, function of, in fetus, 149–150

Parenteral nutrition, for micropremies, 197–219

amino acids in, 198–207
calcium in, 154
drug effects on, 206
for protein accretion, 44–46
glucose in, 29–30, 207–208
growth outcome in, 211–214
lipid emulsions for. See Lipids,
emulsions of.

phosphorus in, 154 protein metabolism in, 29–30 trophic feeding with, 227–228 vitamin concentrations in, 99

vitamin D in, 154-155

in very low-birth weight infants, growth rates and, clinical observations of, 330–333

prospective cohort study of, 333–339 research challenges on, 342

Parents, of very low-birth weight infants, quality of life perceptions of, 407-416

time and medical costs of, 488 Parvovirus B19 infections, hydrops fetalis in, 1015, 1022

Patau's syndrome. See Trisomy 13 (Patau's syndrome).

Patent ductus arteriosus, fluid and electrolyte disorders in, in micropremies, 140 Pearson's syndrome, bone marrow failure

in, 547

Pediatric Evaluation of Disability Inventory, in very low-birth weight infant evaluation, 391

Pena-Shokeir phenotype, of akinesia deformation sequence, 998 Pentalogy of Cantrell, 952, 958–960

Peritoneopericardial diaphragmatic hernia (pentalogy of Cantrell), 952, 958–960 Peritonitis, meconium, 913

Poritrontricular loukomalacia

Periventricular leukomalacia, 304–305 antecedents of. See Cerebral palsy, antecedents of.

imaging of, for outcome prediction, 312–314

ultrasonography in, 305, 308, 310, 312 Peroxidation, of fatty acids, in lipid emulsions, 64–65

of lipids, essential fatty acids and, 83–84 Peroxisome proliferator-activated receptor, in fatty acid metabolism, 76–77

Pfeiffer's syndrome, 820

Phenylalanine kinetics, in low-birth weight infants, 36–38

Phospholipids, in lipid emulsions, 58–59 synthesis of, essential fatty acids in, 80 Phosphorus, in enteral feeding, 155–157

in parenteral nutrition, 154 Phototherapy, for hyperbilirubinemia,

176–178 Phylloquinones (vitamin K), metabolism and requirements of, in micropremies,

Physical activity, versus energy expenditure, 187

Physical therapy, for low-birth weight infants, cost-effectiveness of, 493 Pierre Robin syndrome, 830–831

Placenta, abruption of, as cerebral palsy antecedent, 290

granulocyte colony-stimulating factor in, 564

vessel ablation in, for twin-twin transfusion, 1037–1038

Platelet(s), deficiency of. See Thrombocytopenia.

function of, 644–646 life span of, in thrombocytopenia, 668

mean volume of, in thrombocytopenia, 667–668

reference values for, 645 reticulated, 668

transfusions of, approach to, 735–737 in thrombocytopenia, 669

Pleural effusion, fetal, 886–893 Pneumothorax, as cerebral palsy antecedent, 293 Polycystic kidney disease, 933–937 Polydactyly, 991

in chondroectodermal dysplasia, 994 in Meckel-Gruber syndrome, 937–939

Polyhydramnios, in bronchopulmonary sequestration, 883

in diaphragmatic hernia, 868–870

in fetal hydrothorax, 886

in hydrops fetalis, 1009-1010

in skeletal anomalies, 982

in twin reversed arterial perfusion syndrome, 1038–1042

in twin-twin transfusion syndrome, 1018–1019, 1024–1025

Polymerase chain reaction, for intrauterine infection diagnosis, 1016

Polyunsaturated fatty acids. See Fatty acids, essential.

Popliteal pterygium syndrome, 1000

Porencephaly, 806

Posterior fossa abnormalities, 806–809 Potter's syndrome, 923

Poverty, in outcome of very low-birth weight infants, 440, 443, 446, 449, 451 Preeclampsia, cerebral palsy risk in, 288

Prenatal care, in outcome of very low-birth weight infants, 444, 446, 448-450

Preterm labor and birth, 263–283. See also Very low-birth weight infants. definition of, 263

economics of. See Economics, of prematu-

eosinophilia in. See Eosinophilia. epidemiology of, 264

extremely low-birth weight. See Micropremies.

granulocyte colony-stimulating factor administration in, 568–569

in multiple gestations, 353 indicated, 264

markers of, amniotic fluid, 272-273

bacterial vaginosis, 270 cervical ripening, 273–275 clinical, 273–275

fetal fibronectin, 271–272

future research on, 275–276 genital infections and inflammation, 268–270

uterine activity, 275 mechanisms of, 264-267

endocrine control, 265–266 inflammatory mediators in, 267

prostaglandins in, 266–267 uterine activation, 264–265

necrotizing enterocolitis due to. See Necrotizing enterocolitis.

pathology of, 263–264 physiologic anemia in, 682–687

prevention of, in multiple gestations, 357–358 retinopathy in, erythropoietin in, 531 spontaneous, 264

Preterm milk. See Milk, human, for micropremies.

Prostaglandin(s), in labor control, 266–267 synthesis of, essential fatty acids in, 80 in lipid emulsion administration, 62

Prostaglandin-H synthase, in labor control, 266–267

Proteases, in chronic lung disease pathogenesis, 721–723

Protein C deficiency, thrombosis in, 627, 629-631

Protein metabolism. See also *Amino acids*. in micropremies, **23–56** 

energy expenditure in, 202–205 energy stores and, 24–25 factors affecting, 24 interventions for, 44–49 quantification of, 25–26

quantification of, 25–26 turnover in, 26–39

microfibrillar degradation in, 38–39 versus full-term infants, 27–30 versus low-birth weight infants, 30–35

versus very low-birth weight infants, 35-38

urea metabolism and, 40–44 Protein S deficiency, thrombosis in, 627, 629–631

Prune-belly syndrome, 931
Pterygium syndromes, 998–1000
Pulmonary edema, in micropremies, 138–140

Pulmonary function, lipid emulsion effects on, 63–64

of very low-birth weight infant survivors, in adolescence, 428–431

Pulmonary vascular resistance, lipid emulsion effects on, 63–64

Pyloric hypertrophy, 907

Pyophagus, 1044

Pyridoxine (vitamin B<sub>6</sub>), metabolism and requirements of, in micropremies, 101

Quadriplegia, in cerebral palsy, functional motor outcome in, 385–387 Quadruplet gestations. See *Multiple* 

gestations.

Quality of life, of very low-birth weight infant survivors, 403–419 assessment of, 404–419

children, parent, and health professional comparisons in, 407–415

in care decision making, 415–416 preference measurements in, 405–406 Ouality of life (Continued) concept of, 403-404 Quintuplet gestations. See Multiple gestations.

Radioisotope studies, of energy expenditure, 184-185 of protein metabolism, 26 of urea metabolism, 40-43 RANTES, reference ranges for, 605-608 Rectum, disorders of, 912 Respiratory calorimetry, 183-184 Respiratory distress syndrome, as cerebral palsy antecedent, 293 essential fatty acid effects on, 81 fluid and electrolyte disorders in, 138lipid emulsions and, 64 Respiratory health, of very low-birth weight infant survivors, family and

social factors affecting, 446-447 in adolescence, 428-431

Respiratory quotient, 184

Respiratory syncytial virus infections, in low-birth weight infants, prevention of, 493

Resting metabolic rate, 182-183 Retinoids, metabolism and requirements of, in micropremies, 104-106

Retinopathy, of prematurity, erythropoietin in, 531

Rh antigen, mismatch of, hemolytic anemia in, erythropoietin in, 690 immune globulin in, 737-739

Rhabdomyosarcoma, cystic adenomatoid malformation associated with, 880-881

Riboflavin (vitamin B2), metabolism and requirements of, in micropremies, 100-101

Ribs, anomalies of, assessment of, 981 in asphyxiating thoracic dystrophy.

in hypophosphatasia, 987 in osteogenesis imperfecta, 992, 994 in short rib-polydactyly syndrome,

in thanatophoric dysplasia, 985-986 Rickets, in micropremies, 158

Risky maternal behavior, in outcome of very low-birth weight infants, 440, 445-446, 449, 451

Schizencephaly, 806 Sclerae, blue, in osteogenesis imperfecta, 992, 994

Seckel's syndrome, bone marrow failure in. 546

Selenium, metabolism and requirements of, in micropremies, 125-126 Self-regulation, in preterm infants, early pain experience and, 373 Sepsis, as cerebral palsy antecedent, 294

essential fatty acid effects on, 82-83 fluid and electrolyte disorders in, in micropremies, 132

granulocyte transfusions in, 737

immune globulin in, 737-739 neutropenia in, granulocyte colony-stimulating factor in, 739-741

Septostomy, amniotic, in twin-twin transfusion syndrome, 1024, 1036-1037

Shock, granulocyte transfusions in, 737 immune globulin in, 737-739

in micropremies, 132-135 in asphyxia, 132

in capillary leak syndrome, 134 in immature organ development, 132-

in sepsis syndrome, 132 treatment of, 134-135

Short rib-polydactyly syndrome, 991 Shwachman-Diamond syndrome, bone marrow failure in, 546, 550

Siamese twins, 1042-1045 Situs inversus totalis, 916 Skeletal anomalies, 979-1005

achondrogenesis, 988-990 achondroplasia, heterozygous, 983-984

homozygous, 987 arthrogryposis, 998-1000 asphyxiating thoracic dystrophy, 991 campomelic dysplasia, 990-991 chondroectodermal dysplasia, 994-995 diastrophic dysplasia, 995-996 ethnic factors in, 980

evaluation of, 980-983 hypophosphatasia, 987-988 in trisomies, 775

lethal, 984-994 limb defects, 996-997

molecular genetic analysis of, 983 osteogenesis imperfecta, 991-994 potentially lethal, 994-1000 short rib-polydactyly syndrome, 991

thanatophoric dysplasia, 985-987 Skin, water loss through, hyperosmolar state in, in micropremies, 135-138 Skull, anomalies of, 814, 818-820

Small-for-gestational age, 326 Small intestine, disorders of, 907-908 erythropoietin in, 531-533 herniation of, 917-918

motility of, development of, 224 Socioeconomic factors, in cerebral palsy,

in very low-birth weight infant outcome. See Family factors and social

support, in outcome of very low-birth weight infants.

Sodium, depletion of, in hyponatremia of prematurity, 142–143

restriction of, in hyperosmolar state, 137-138

Spasticity, in cerebral palsy, functional motor outcome in, 385–387 in periventricular leukomalacia, 312

Special education, prematurity-associated, 492–494

Spina bifida, 793-795

Starling's forces, disruption of, in micropremies, 134

Stem cells, in erythropoiesis, switching from fetal to adult, 511–514

Sternum, cleft, in pentalogy of Cantrell, 952, 958–960

Stomach, disorders of, 905–907 motility of, development of, 224

Strawberry-shaped skull, 818 Streptococcal infections, group B, preterm birth in, 268

Streptokinase, for thrombosis, 632–636 Stress, amino acid metabolism in, 205–206 in pain, 364–365

in parents, of very low-birth weight infants, 488

Stuck-twin syndrome. See Twin-twin transfusion syndrome.

Surfactant, composition of, essential fatty acid effects on, 79–80

dysfunction of, in chronic lung disease pathogenesis, 724

in respiratory distress syndrome, cerebral palsy and, 293

Surfactant Collaborative

Neurodevelopmental Outcomes Network, disablement models of, 382 Survival, of very low-birth weight infants,

255–262 data limitations for, 256–257 predictors of, 255–256 summary of reports for 1990s, 257–259 viability limit, 259–260

Swallowing, development of, 223

Temperature, environmental, versus energy expenditure, 186–187
Teratogenesis, facial clefts in, 829
Teratoma, intracranial, 805
Tetralogy of Fallot, 851–854
Thalassemia, hydrops fetalis in, 1017, 1023
Thanatophoric dysplasia, 985–987
Thermogenesis, diet-induced, 186
Thiamine (vitamin B<sub>1</sub>), metabolism and requirements of, in micropremies, 97
Thoracentesis, in fetal hydrothorax, 889,

Thoracic anomalies, 865–899. See also *Heart disease, congenital.* 

bronchopulmonary sequestration, 881–886

cystic adenomatoid malformation, 875–881, 1023–1024

diaphragmatic hernia, 866-875 embryology of, 866

hydrops fetalis in, 1017–1018, 1023–1024 hydrothorax, 886–893, 1023–1024

in skeletal anomalies. See Skeletal anomalies.

Thoracoabdominal ectopia cordis (pentalogy of Cantrell), 952, 958–960

Thoracopagus, 1043–1044
Thrombectomy, surgical, 636
Thrombocytopenia, 655–679
amegakaryocytic, 547, 553, 662
bone marrow failure in, 547, 553
classification of, 657–666
definition of, 655
idiopathic, 666
impurpe, 657, 669

immune, 657–659 immune globulin in, 737–739 in genetic disorders, 661–663 in infections, 659–660

in thrombocytopenia-absent radius syndrome, 613-614, 663-664

incidence of, 655–657 mechanisms of, indicators of, 667–669 platelet transfusions in, 735–737

Thrombocytopenia-absent radius syndrome, 613

bone marrow failure in, 547, 554–555 Thrombolytic therapy, for thrombosis, 632–636

Thrombophilia, thrombosis in, 627 Thrombopoietin, therapeutic use of, in necrotizing enterocolitis, 701, 704

Thrombosis, 623–641 arterial, presentation of, 627 diagnosis of, 628–629, 747–750 in prothrombotic disorders, 629–631 incidence of, 625 physiology of, 623–625 presentation of, 627–628, 747 risk factors for, 625–627, 748 thrombocytopenia in, 664–665 treatment of, 631–636

treatment of, 631–636 approach to, 751–753 heparin in, 631–632 observation in, 631 thrombectomy in, 636 thrombolytic therapy in, 632–636 umbilical cord, 969

venous, presentation of, 627–628 Thumb, hitchhiker, in diastrophic dysplasia, 995

Thyroid gland, anomalies of, 834 Thyroid hormone, abnormalities of,

cerebral palsy in, 287 Thyroxine, deficiency of, in micropremies, 126–127 Tissue plasminogen activator, for thrombosis, 632–636

Tocopherols, metabolism and requirements of, in micropremies, 108–110
Tongue, anomalies of, 817, 829–830

Tpo peptide, in thrombocytopenia, measurement of, 668

replacement of, 670-671

Trace elements, metabolism and requirements of, in micropremies,

119-129

copper, 123-125 iodine, 126-127

iron, 119-121

manganese, 127 selenium, 125–126

zinc, 121-123

Tracer studies. See Radioisotope studies.

Trachea, occlusion of, intrauterine, in diaphragmatic hernia management, 872–873

Tracheoesophageal fistula, 903–905 Transfusion, erythrocyte, approach to, 734–735

granulocyte, approach to, 737

in anemia, requirements for, erythropoietin and, 683–688, 691–692

in hyperbilirubinemia, 176–178

neutrophil, approach to, 737 in neutropenia, 590–591

platelet, approach to, 735–737 in thrombocytopenia, 669

twin-twin. See Twin-twin transfusion syndrome.

Transient hypothyroxinemia of prematurity, cerebral palsy in, 287

Transplantation, heart, in hypoplastic left heart syndrome, 845

Transposition of great arteries, 856–858 Treacher-Collins syndrome, 829–831

Tricuspid valve, displacement of, in Ebstein's anomaly, 847–849

Triglycerides, in lipid emulsions, 58–59 Triplegia, in cerebral palsy, functional motor outcome in, 385–387

Triplet gestations. See *Multiple gestations*. Triploidy, ultrasonography of, major

abnormalities, 772–773 Trisomies, thrombocytopenia in, 662 ultrasonography of, early growth restriction in, 769

fetal heart rate in, 769

Trisomy 8, ultrasonography of, major abnormalities in, 763–764

Trisomy 13 (Patau's syndrome), ultrasonography of, 762 major abnormalities, 772 major abnormalities in, 763–764 skeletal anomalies in, 775

Trisomy 18 (Edward's syndrome), 802-803

ultrasonography of, 762 choroid plexus cysts in, 778–780 major abnormalities in, 772 skeletal anomalies in, 775

Trisomy 21 (Down syndrome), bone marrow failure in, 546, 551–552

thrombocytopenia in, 662 ultrasonography of, 762

amniocentesis with, 781–782 choroid plexus cysts in, 778–780

echogenic bowel in, 774–775 major abnormalities, 772

major abnormalities in, 763 mild cerebral ventricular dilatation in, 780–781

nuchal thickening in, 773–774 nuchal transparency in, 765–767, 769 papillary muscle calcification in, 776–

778 renal abnormalities in, 775–776

skeletal anomalies in, 775 Trophic feeding, for micropremies, 227–229

Truncus arteriosus, 859–861 Tryptophan, supplementation with,

eosinophilia due to, 617 Tube thoracostomy, 893

Tubes, for enteral feeding, 227 Tumor(s), hydrops fetalis in, 1018, 1024 intracranial, 805

umbilical cord, 968–969

Tumor necrosis factor-α, in labor control, 267

Turner's syndrome, thrombocytopenia in, 662

Twin gestations. See also Multiple gestations. cerebral palsy risk in, 287–288

conjoined, 720 Twin reversed arterial perfusion

syndrome, 1038–1042 Twin-twin transfusion syndrome,

1033–1038 differential diagnosis of, 1035 hydrops fetalis in, 1018–1019, 1024–1025

incidence of, 1034 management of, 1036–1038 pathology off, 1033–1034 prenatal appearance of, 1034

Ultrasonography, cervical, in preterm labor

prediction, 273–275 cranial, in intraventricular hemorrhage, 305–307, 310

in periventricular leukomalacia, 305, 308, 310, 312

in ventriculomegaly, 305, 309–310, 314–315

timing of, 309-310

versus magnetic resonance imaging, 315–316

in chromosomal abnormalities, **761–789** central nervous system, 780–781 choroid plexus cysts, 778–780 Doppler, 769 early growth restriction in, 769 echogenic bowel, 774–775, 912–914 fetal heart rate in, 769

first trimester, 763–770 major, 763–764, 772–773

nuchal thickening, 773–774 nuchal translucency marker

nuchal translucency marker in, 764-769

papillary muscle calcification, 776–778 renal abnormalities, 775–776 risk assessment in, 781–782 second trimester, 770–782 skeletal anomalies, 775

in congenital anomalies. See specific anomalies.

three-dimensional, 834-835

Umbilical cord, anomalies of, 966–972 alpha-fetoprotein levels in, 947–948 body stalk anomaly, 949, 952–954 congenital absence, 949, 952–954 cysts, 967–968

embryology of, 947–948, 950–951, 965–966

funic presentation, 970–971

knots, 972 masses, 967–969 nuchal, 971–972

omphalocele. See Omphalocele.

persistent right vein, 967 prolapse, 970-971

short, 949, 952-954 single artery, 966-976

tumors, 968–969 varices, 968

vasa previa, 970

vascular anomalies, 967–969 velamentous insertion, 969

coagulation of, in twin reversed arterial perfusion syndrome, 1041–1042 occlusion of, in twin reversed arterial

perfusion syndrome, 1041 Urea, metabolism of, 40–44

recycling of, 43–44 synthesis of, 41–43

Ureaplasma infections, in chronic lung disease pathogenesis, 720

preterm birth in, 269 Ureter, dilatation of, 930

Ureteroceles, 930 Ureteropelvic junction obstruction, 929–930 Urethra, anomalies of, 931–932 Urethral valves, posterior, 930–931

Urine, granulocyte colony-stimulating factor in, 562

Urokinase, for thrombosis, 632–636 Urologic anomalies, 921–945

bladder exstrophy, 925–926, 952, 962–963 cloaca exstrophy, 925–926, 952, 960–962 embryology of, 921–922

hydrops fetalis in, 1018, 1024

imaging of, 923-924

in chromosomal abnormalities, 939–940 in Meckel-Gruber syndrome, 937–939

in MURCS association, 939 in VACTERL association, 939

kidney, agenesis, 924–925 cystic disease, 933–937

obstruction, 927-933

hydronephrosis in, 775–776, 927–929 lower tract, 930–933

upper tract, 929–930

versus normal function, 922-923

Uterus, activation of, in labor, 264–265 activity of, monitoring of, in preterm la-

bor prediction, 275 erythropoietin in, 531

infections of, as cerebral palsy antecedent, 289–290

preterm birth in, 268-270

interventions within, cystic adenomatoid malformation resection, 879–880 diaphragmatic hernia repair, 872–874 fetal hydrothorax drainage, 890–892 in fetal urinary obstruction, 932–933

VACTERL association, 939

Vaginosis, bacterial, preterm birth in, 270

Vanishing twin syndrome, 1034 Varices, umbilical cord, 968

Vasa previa, 970 VATER association, 904

Velocardiofacial syndrome, 827–828 Vena cava, thrombosis of, 628

Venous thrombosis, 627–628

Ventricle(s), double-inlet, 858–859 right, double-outlet, 854–856

hypoplastic, 851 Ventricular septal defect, 849–851

Ventriculomegaly, 305, 795–799 imaging of, for outcome prediction, 314–

types of, 315-316

ultrasonography in, 305, 309–310, 314–315

mild, 780-781

Very low-birth weight infants, arousal in, 373

attention in, 373

outcome of, biology versus environment, 461-481

brain development. See Brain, development of. Very low-birth weight infants (Continued) cerebral palsy antecedents, 285–302 economics and, 483–497 family factors in, 433–459 functional, 381–401 growth. See Growth. in adolescence, 372–372, 407–416, 421–432 in multiple gestations, 325–345 pain perception and, 363–379 preterm birth pathogenesis and mark-

ers, 263–283 quality of life, 403–419 respiratory, 428–431, 446–447 survival rates, 255–262 self-regulation in, 373

Viability, limit of, in neonates, 259–260 Vineland Adaptive Behavior Scale, in very low-birth weight infant evaluation, 391, 394

Vision, development of, essential fatty acids for, 85

limitations of, in very low-birth weight infant survivors, family and social factors affecting, 446–447

Vitamin(s), metabolism and requirements of, in micropremies, 95–118 fat-soluble, 104–112 water-soluble, 96–104

Vitamin A, metabolism and requirements of, in micropremies, 104–106

Vitamin B<sub>1</sub>, metabolism and requirements of, in micropremies, 97

Vitamin B<sub>2</sub>, metabolism and requirements of, in micropremies, 100–101 Vitamin B<sub>6</sub>, metabolism and requirements

of, in micropremies, 101 Vitamin B<sub>12</sub>, metabolism and requirements of, in micropremies, 101–102

Vitamin C, metabolism and requirements of, in micropremies, 96–97

Vitamin D, metabolism and requirements of, in micropremies, 106–108, 154–155 Vitamin E, metabolism and requirements of, in micropremies, 108–110 Vitamin K, metabolism and requirements of, in micropremies, 110–112

Vitelline artery, persistent, 969

Water, doubly labeled, in energy expenditure measurement, 184–185 transepidermal loss of, hyperosmolar state in, in micropremies, 135–138 Weight. See also *Birth weight*.

Weight. See also *Birth weight*. of very low-birth weight infant survivors, in adolescence, 421–428

White matter damage. See also Periventricular leukomalacia. antecedents of. See Cerebral palsy, antecedents of.

Wiskott-Aldrich syndrome, thrombocytopenia in, 662–663 WT syndrome, bone marrow failure in, 547

Xiphopagus, 1043-1044

Yolk sac, erythropoiesis in, 509

Zinc, metabolism and requirements of, in micropremies, 121–123 Zygosity, of multiple gestations, outcome

and, 354

